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# Agricultural Experiment Station

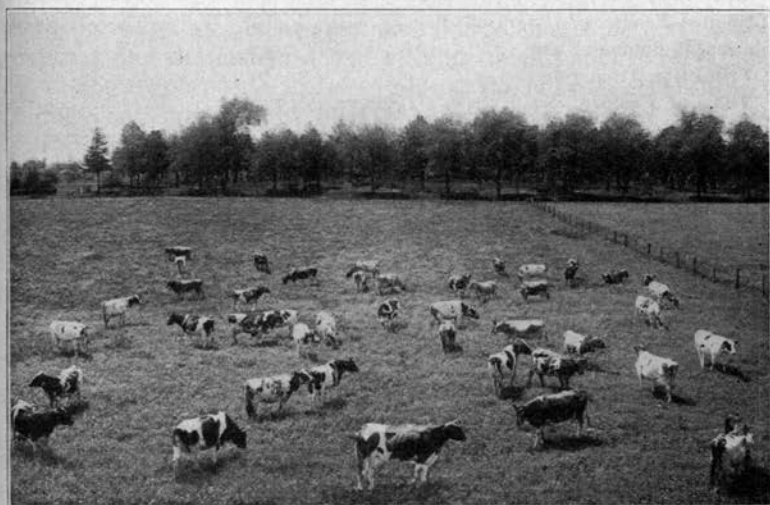
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CIRCULAR No. 204

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## CARE AND MANAGEMENT OF THE DAIRY HERD

BY R. S. HULCE AND W. B. NEVENS



URBANA, ILLINOIS, AUGUST, 1917

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# CARE AND MANAGEMENT OF THE DAIRY HERD

BY R. S. HULCE, ASSOCIATE IN MILK PRODUCTION, AND  
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## INTRODUCTION

Intelligent care of the dairy herd is essential to profitable milk production. In order that each animal may contribute its share to the income derived from the herd it must receive individual attention and care, and have the benefit of those general practices in the management of the herd which have been found by dairymen to give the best results. The following suggestions on the care and management of the dairy herd are intended to apply to general dairy conditions in Illinois rather than to all specialized phases of milk production.

## PROBLEMS OF GENERAL CARE

### REGULARITY

Dairy cows readily become accustomed to a regular daily program any interruption of which acts as a disturbing influence and tends to cause a decrease in milk production. There should be certain hours for milking and the same order of milking should always be followed. Thus, at the regular time the cows release the muscles controlling the milk ducts so that the milk is given down more quickly and easily. Regularity in milking is one of the important factors in keeping the milk flow constant.

It is immaterial whether the cows be fed grain before or after roughage, but it is desirable that the feeding be done at regular intervals and that the feeds always be given in the same order. Feeds which have considerable odor are usually fed after milking in order to prevent the absorption of odors by the milk.

### KINDNESS

In the hurry of getting chores done, the dairyman sometimes forgets that dairy cows are naturally of a nervous and excitable disposition, and that under conditions of excitement or fear the milk flow is materially lessened. Driving cows on the run, chasing them by dogs and with loud shouting are not allowed on a well-managed dairy farm. In the stable all operations should be carried on quietly. When a cow kicks there is usually a reason for it; the teats may be hurt by

the milker or the cow may be frightened. At such a time a little care in removing the cause and pacifying the cow will often prevent further trouble. Many good cows become confirmed kickers and consequently less profitable as a result of lack of careful observation and kindness on the part of the attendants.

### CARE AT FRESHENING

The work of milk production, particularly in the case of a heavy producing dairy cow, coupled with that of the production of offspring, is a severe tax upon her vitality. In order that a cow may begin her period of lactation in good physical condition, it is desirable that she be given a rest of six to eight weeks previous to freshening. The length of the rest period is determined, not by any hard and fast rule, but rather by the amount of time necessary to put the cow in a good condition.

*Drying-off the Cow.*—Two of the essentials in reducing the milk flow are: milking less frequently and supplying less feed. If the feed supply is decreased and the cow is milked as usual, since the act of milking is a stimulus to milk secretion, she will draw upon the surplus energy stored in her body in order to produce a normal amount of milk. Therefore, if the feed is reduced the milkings should be less frequent. When cows are giving a large amount of milk the drying-off process may be begun by leaving part of the milk in the udder at the regular milking period. After a few days one of the daily milkings may be omitted entirely. As the milk flow decreases, the milking may be done once in two days and then once in three days until the amount has been reduced to three or four pounds daily, when the cow need not be milked further. It is important that the drying-off process take place gradually in order to prevent injury to the udder.

*Feeding During the Rest Period.*—During the rest period the cows should be fed so that they will be in good flesh at the time of freshening. It has been shown that cows of the dairy type which are in good flesh at freshening tend to produce milk of a higher butter-fat content than those that freshen in very poor condition.<sup>1</sup> The grain mixture to be fed during this period may consist of two parts corn meal and one part bran or ground oats. If good pasture is available, grain may not be necessary.

*Care Just Before Freshening.*—It is important that the ration during the latter part of the rest period be somewhat laxative. This is a matter deserving special attention if the cow is receiving dry feed. In this case, it is important that she be fed a good quality of legume hay, such as clover, alfalfa or cowpea, or other laxative feed, such

<sup>1</sup>Eckles, C. H., Mo. Agr. Exper. Sta. Bul. 100.

as silage. Any one of the following grain mixtures, which are somewhat laxative, may be used to supplement the roughage.

Equal parts of bran and ground oats

Two parts ground oats and one part oil meal

Equal parts ground oats, bran, and oil meal

Two or three days before the cow is expected to calve, she should be placed in a clean, dry, and well-bedded box stall. During the day in mild weather she may be turned out-of-doors, as a moderate amount of exercise during this period is beneficial. If a laxative ration has not been fed, a drench of Epsom salts, prepared as described on page 15, should be given. When a cow is given careful attention previous

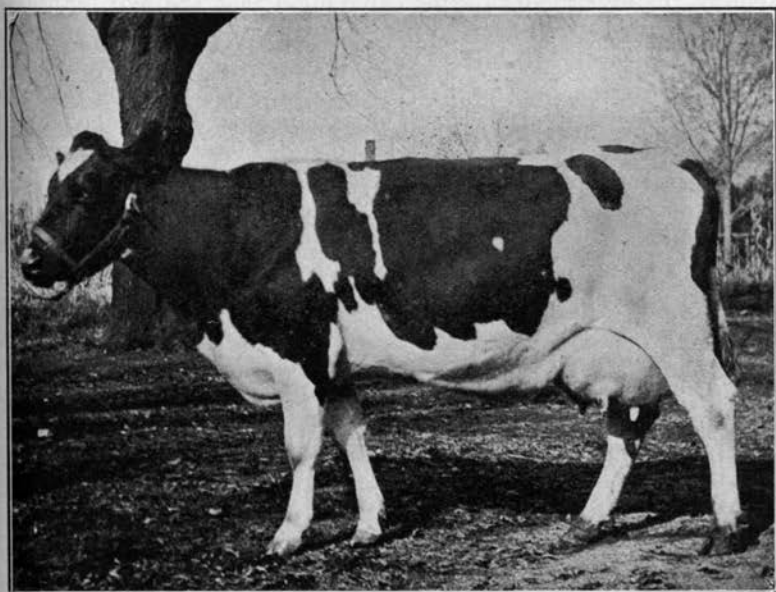


FIG. 1.—A COW IN GOOD CONDITION PRIOR TO CALVING  
Produced 95 pounds of milk per day subsequent to calving

to freshening, fewer of the troubles attendant upon calving, such as retention of the afterbirth, milk fever, and udder troubles, are experienced.

*After Freshening.*—After the calf is dropped, careful attention should be given to the comfort of the cow. In summer it is well to spray her with a fly repellant, and in winter cold drafts should be avoided. If the temperature of the barn is very low, blanketing the cow for a few days is desirable. The stall should be supplied with an abundance of dry bedding.

Just after calving, the cow should not be allowed to become chilled by drinking cold water. The drinking water should be lukewarm



during the first day at least, and for a few days should be not colder than that coming from a deep well.

*Swollen Udder.*—Some inflammation is usually present in the udder at freshening which causes a swollen and caked condition. By rubbing the udder vigorously with the hands several times a day or by allowing the calf to nurse for a few days, the inflammation may be reduced. When the udder is not greatly inflamed or caked, the swelling will usually subside in a few days provided milk is being given from all quarters. If the udder is severely caked, special treatment may be applied as described on page 18.

*Feeding after Calving.*—It is very important the cow be fed grain sparingly for several days after calving, so that she may gradually become accustomed to the feed. A small quantity of bran fed as a warm mash proves helpful. The grain ration which was fed just previous to calving may be fed for a few days beginning with the second or third day, after which the grain may be changed to the mixture which the cow is to receive during the lactation period. If the udder is not severely inflamed or caked, four or five pounds of grain per day may be fed on the third or fourth day and the amount increased at the rate of one-half pound per day. The grain may be increased as long as the cow continues to respond with a proportionate increase in milk flow. A legume hay and silage may be given in such quantities as the cow will consume. When these feeds are used, the amount of grain fed to Jersey cows should be about one pound per day to each two and one-half to three pounds of milk produced daily, and to Holsteins about one pound to each three to four pounds of milk.

Additional information on feeding dairy cows is given in Circular 152 of this station.

#### LENGTH OF TIME COWS ARE PROFITABLE

Cows usually reach their maximum production between the ages of six and eight years, after which time the annual production begins to decrease. When the heifer calves from the best cows only are raised, one-fifth to one-fourth of the cows in the herd may be replaced by the heifers each year; in this way, or when purchase is the method employed in replacing cows, few need be kept beyond the age of eight years.

Cows are less profitable milk producers during their first lactation period than when they become mature, since part of the feed is used for growth. The loss occasioned by this additional cost of milk production is usually offset by the better prices which can be secured for the mature cows when they are sold before passing their prime. Good cows may be profitable producers up to the age of fifteen years, but comparatively few are kept to that age except for breeding purposes. After cows reach the age of eight years, the uncertainty as

to how long they will continue to be profitable on account of failure to breed and their lessened resistance to ailments becomes more marked. The uncertainty is probably greater where forced feeding in record making is practiced.

### REPLACING COWS IN THE HERD

One of the discouraging but usually certain losses involved in milk production is the depletion of the milking herd thru accident, failure to breed, or disease. It is sometimes a serious problem whether to maintain the normal quota of the herd simply by the purchase of cows of milking age or by rearing the heifer calves from the best cows in the herd.

*Purchasing.*—When cows are replaced by purchase of others, the labor required in caring for the calves is reduced to a minimum, since the calves are sold at an early age. Under certain conditions, such as inadequate barn facilities for raising calves, limited pasture, and high prices for whole milk, purchase may be the more feasible method for maintaining the desired number of cows in the herd. However, the danger of the introduction of disease into the herd is greatly increased by the purchase of animals. In purchasing cows on the open market records of previous production are usually lacking, so that judgment as to their productive ability is based on physical appearance alone. Some cows thus purchased prove disappointing as milk producers, since conformation is not always a reliable index to the value of dairy cows.

*Rearing Dairy Animals.*—When the heifers are reared to replace the cows, there is less opportunity for the introduction of disease, altho if calves are fed on unpasteurized skim milk or whey from a creamery or cheese factory, there is a chance that they may become infected with diseases from other herds. The skim milk or whey should be thoroly pasteurized at the factory before being returned to the farm.

When a bull capable of transmitting high milk-producing qualities to his offspring is used, the rearing of the heifer calves from the best cows is usually an economical and certain method of securing high-producing animals to replace the aged cows. One of the greatest advantages in rearing such calves is that it is possible not only to maintain the standard of quality in the herd, but to gradually increase its production.

### SEASON FOR FRESHENING

Some of the factors which determine the season at which the herd shall freshen are: length of the pasture season, amount of labor available, and market demands.

*Spring Freshening.*—Where it is possible for the herd to secure an abundance of good feed on pasture thruout a considerable portion of the year, it is usually desirable to have the cows freshen in the spring in order that one may take advantage of the inexpensive feeds at the stage of lactation when the largest amount of nutrients in the ration must be supplied.

*Fall Freshening.*—There are several advantages in having the cows freshen in the fall provided there is a sufficient supply of labor available during the winter months. Cows freshening in the fall may be fed so that they will produce a good flow of milk during the winter months. During the latter part of this period the flow tends to decrease, but it will be increased with the stimulus of spring pasture. The period of smallest flow will be during the latter part of the summer, when conditions are not favorable for high milk production and labor can be used to advantage in other farm work. This tends to equalize labor to a greater extent than when the majority of the cows freshen in the spring.

Calves born in the fall make good growth during the winter and are able to make some use of the pasture in the spring. Calves born in the spring are not sufficiently mature to make much use of pasture even in the latter part of the same season, on account of the annoyance of heat and flies.

When the milk is sold to a whole-milk market, it may be more profitable to have the cows freshen in the fall, since prices for whole milk are usually higher in winter.

#### BREEDING AGE FOR HEIFERS

The age at which heifers should freshen depends largely upon their development and the season when it is desired to have most of the cows freshen. Altho the larger breeds do not mature at so early an age as the smaller ones, in most cases it is possible by liberal feeding to obtain sufficient growth so that heifers may profitably be bred to freshen at two years of age. It is seldom desirable for a heifer to freshen at an earlier age.

In deciding upon the time to breed, the size and development should be given greater consideration than the age, since it is important that the heifer have good growth by the time she freshens. However, if allowed to become too mature before breeding, especially in the case of animals that are heavily fed, there is sometimes difficulty in getting the heifers in calf.

It is undesirable to have cows freshen during the latter part of the summer because their milk production will be seriously hindered by hot weather, flies, and dried-up pastures. Rather than have heifers freshen during the summer months, it is advisable to postpone their breeding so that they will freshen during the cooler season.



Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve	Date of service	Due to calve
Jan. 1	Oct. 10	Feb. 1	Nov. 10	Mar. 1	Dec. 8	Apr. 1	Jan. 8	May 1	Feb. 7	June 1	Mar. 10	July 1	Apr. 9	Aug. 1	May 10	Sept. 1	June 10	Oct. 1	July 10	Nov. 1	Aug. 10	Dec. 1	Sept. 9
2	11	2	11	2	9	2	9	2	8	2	11	2	10	2	11	2	11	2	11	2	11	2	10
3	12	3	12	3	10	3	10	3	9	3	12	3	11	3	12	3	12	3	12	3	12	3	11
4	13	4	13	4	11	4	11	4	10	4	13	4	12	4	13	4	13	4	13	4	13	4	12
5	14	5	14	5	12	5	12	5	11	5	14	5	13	5	14	5	14	5	14	5	14	5	13
6	15	6	15	6	13	6	13	6	12	6	15	6	14	6	15	6	15	6	15	6	15	6	14
7	16	7	16	7	14	7	14	7	13	7	16	7	15	7	16	7	16	7	16	7	16	7	15
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16	25	16	25	16	23	16	23	16	22	16	25	16	24	16	25	16	25	16	25	16	25	16	24
17	26	17	26	17	24	17	24	17	23	17	26	17	25	17	26	17	26	17	26	17	26	17	25
18	27	18	27	18	25	18	25	18	24	18	27	18	26	18	27	18	27	18	27	18	27	18	26
19	28	19	28	19	26	19	26	19	25	19	28	19	27	19	28	19	28	19	28	19	28	19	27
20	29	20	29	20	27	20	27	20	26	20	29	20	28	20	29	20	29	20	29	20	29	20	28
21	30	21	30	21	28	21	28	21	27	21	30	21	29	21	30	21	30	21	30	21	30	21	29
22	31	Nov. 22	Dec. 1	22	29	22	29	22	28	22	31	22	30	22	31	July 22	1	Aug. 22	31	22	31	22	30
23	1	23	2	24	31	24	31	23	1	23	1	23	1	23	1	23	2	23	1	23	1	23	1
24	2	24	3	Jan. 25	1	25	1	25	2	24	2	24	2	24	2	24	3	24	2	24	2	24	2
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29	7	29	8	29	6	30	6	30	7	29	7	29	7	29	7	29	8	29	7	29	7	29	7
30	8	..	..	30	7	..	..	31	8	..	..	31	8	31	8	..	..	31	8	..	..	31	8
31	9	..	..	31	8	..	..	..	9	..	..	..	9	..	9	..	..	..	9	..	..	..	..

## THE HERD BULL

*Selection.*—A pure-bred animal transmits his characteristics with greater certainty than does an animal of mixed breeding. There are but few cases where the use of a grade or scrub bull is justifiable. Most dairymen underestimate the value of a good sire, and are therefore not willing to pay a premium to secure an animal of merit.

The sire should have good conformation and be typical of the breed which he represents. It is fully as important also that he come from a family whose members are good producers, as evidenced by milk and butter-fat records.

*Care of Young Bull.*—The young bull should be kept in good growing condition by being supplied with an abundance of feed and allowed plenty of exercise. Where it is possible to allow the bull to run at pasture by himself or with other bulls during the first or perhaps the first and second summers, the work of caring for him is much lessened.

When quite young, the bull should be trained to be led by a halter. By the time he is a year old, a strong ring should be inserted in his nose so that he can be led by a staff. It is not safe to try to lead a grown bull merely by a halter or rope fastened to his ring. In leading by the staff, the caretaker should always walk at the side and never in front of the bull. One of the essentials in training the young bull is that he must be taught that his caretaker is his master. Bulls known to be vicious are usually handled with care, with the result that fewer accidents are likely to occur with them than with those considered gentle.



FIG. 2.—STAFF FOR LEADING BULL, SHOWING METHOD OF ATTACHMENT TO NOSE RING  
(Courtesy of H. A. Moyer)

*Age for Service.*—After the bull is six months of age, he should be kept apart from the females. If well grown and vigorous, he may be used for occasional service when ten months of age. It is a safer plan, however, not to use the young bull until he is twelve months of age so that his growth will not be retarded. One rule to follow regarding the number of cows with which a young bull may be mated is that the bull may serve during a season as many cows as he is months of age. In herds where the services are distributed thruout the year instead of during a particular season, the number may be greater, in some cases but one bull being necessary for a herd of forty to fifty cows.

It is not advisable to allow a bull to serve more than two cows during one day, and these services should be as many hours apart as

possible. The bull should not be allowed to waste his vitality by the repeated service of a cow during a given period of heat.

*Ring.*—The ring for a bull should be strong and of non-rusting material, such as copper or gun metal. In ringing the bull the first precaution is to tie the animal securely in a stanchion so that he

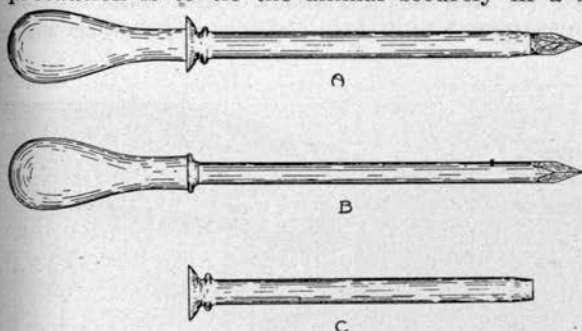


FIG. 3.—A—TROCAR AND CANULA READY FOR INSERTION  
B—TROCAR. C—CANULA

cannot lunge forward upon the operator, his head being firmly held by a halter. The best instrument for puncturing the nasal septum and inserting the ring is the trocar and canula, which should be dipped into a disinfecting solution before being used.

The operator grasps the nose and inserts the trocar. The trocar is withdrawn leaving the canula in place. One end of the open ring is inserted in the canula and the latter withdrawn, thus drawing the ring thru the nose.

As a precaution against losing the screw which fastens the ring, a piece of canvas or cloth should be spread on the floor. If the screw becomes roughened in fastening it in the ring, it may be smoothed with a file.

*Feed.*—The ration for a mature bull should be similar to that needed by cows in milk. A good quality of legume hay, such as clover or alfalfa, may well form the basis of the ration, this being supplied in such amounts as will be readily consumed. In addition a sufficient amount of a grain mixture containing considerable protein should be fed to keep the bull in good condition. It is considered undesirable to feed large amounts of corn silage to the herd bull, especially during the season of heavy service, 10 to 15 pounds daily being the maximum amount which should be fed.

*Housing.*—It is not a good practice to allow the bull to run with the herd, since in so doing he may waste his vitality as mentioned above and it is impossible for the herdsman to know or control the time when the cows will freshen. Then, too, there is always danger that the bull will cause damage by breaking thru fences.

A box stall in one corner of the cow barn, or a separate barn or shed may be provided for the bull. In all cases the shelter should connect with a strongly fenced yard or paddock in which the bull may exercise.

*Exercise.*—It is essential that the bull have sufficient exercise in order to maintain his vigor. When stabled continuously, he tends to become sluggish and less sure as a breeder. If he does not take sufficient exercise when allowed to run at will, barrels or stumps may be placed in the yard for him to bunt about. Most bulls may be trained to operate a treadpower and thus perform useful work while getting exercise.



FIG. 4.—BULL BEING EXERCISED IN TREAD POWER

*Vicious Bulls.*—Many dairy bulls which have proven valuable as breeders become vicious and hard to handle after reaching maturity and are unnecessarily slaughtered on this account. When proper quarters are available and care is used, the period of usefulness of a bull may be greatly lengthened. The accompanying illustration presents a plan whereby he may be comfortably housed without the necessity of handling him.

One of the principal requirements of such quarters is that they be strongly constructed. The fence enclosing the yard may be of wood, iron, or masonry construction. If of wood, the horizontal pieces should be not less than 2 x 6 inches in size. The sliding door of the stall may be raised and lowered from the entrance to the feeding manger by means of a rope and pulley.

The breeding pen connecting with the exercising yard is a convenience for use in breeding cows when the bull is running loose. The

method of procedure in using the breeding pen is as follows: Gateways *B* and *C* are closed. The cow is led into the breeding pen thru gateway *A*. The latter is then closed, thus opening gateway *B* to admit the bull. In removing the animals from the pen, the bull is first forced backward into the exercising yard and gateway *B* closed. The cow may then be led out thru gateway *C*. (See Fig. 6)

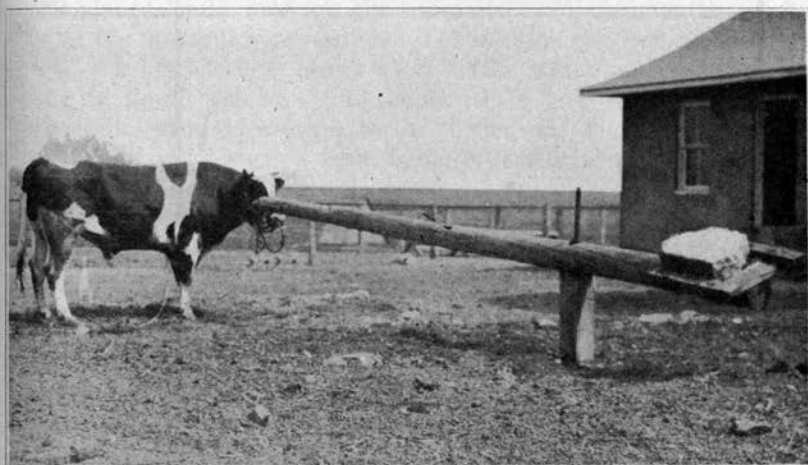


FIG. 5.—EXERCISING A BULL BY TYING HIM TO THE END OF A SWEEP WHICH HE MAY REVOLVE AT WILL

#### COMMON DISEASES OF DAIRY CATTLE

The caretaker of a dairy herd must be able to recognize and treat some of the common diseases affecting cattle, since they are likely to occur at any time. In many cases it may be advisable to employ the services of a trained veterinarian, but often helpful home treatment may be given. Careful observation at all times usually results in detecting approaching illness, and frequently simple remedies may be applied in time to prevent further development. Prevention is far better than cure, and less expensive.

It is well to keep on hand some of the simple and well-known drugs such as Epsom salts, saltpeter, gum camphor, ginger, tincture of iodine, and alum water, and such apparatus as a milk-fever outfit, trocar and canula, fever thermometer, hose and funnel, and drenching bottle.

*General Treatment of Disease.*—In all cases of sickness it is usually advisable to reduce the ration and provide laxative feeds such as alfalfa hay, bran, or oil meal. Animals which have lost their appetite may be tempted to eat by being given small quantities of such feeds as



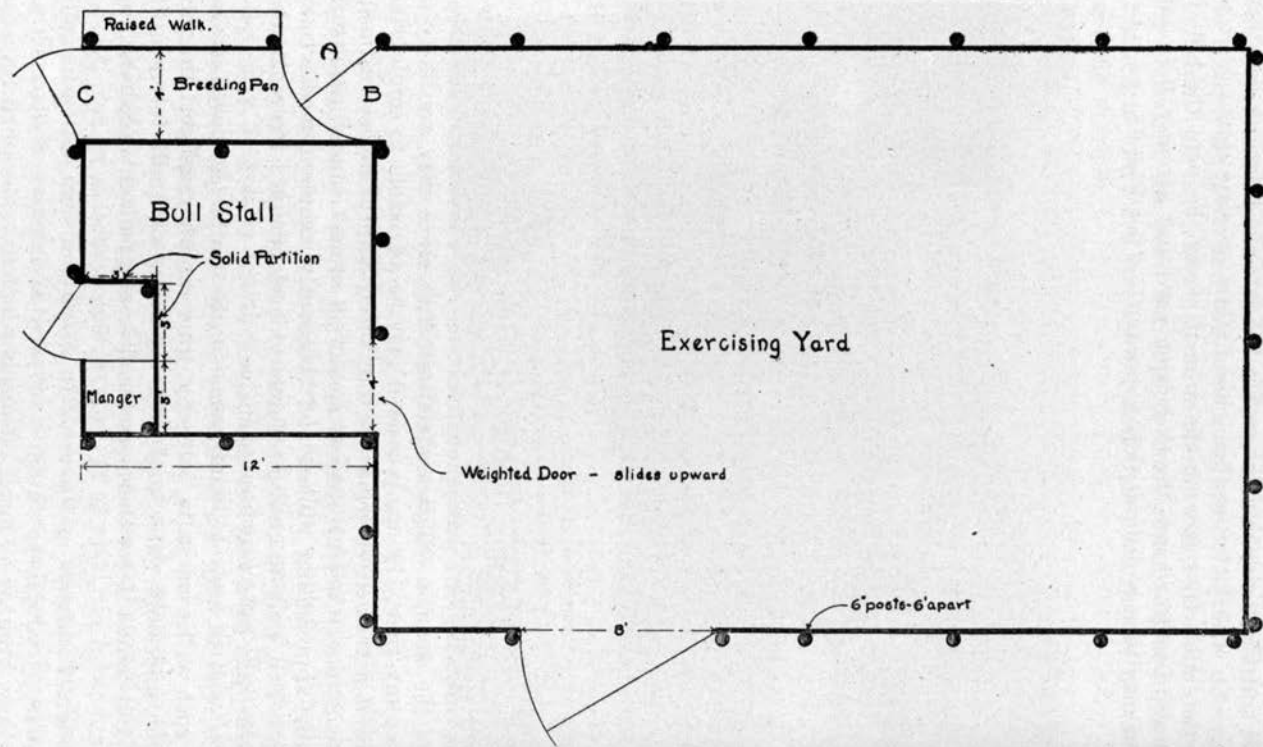


FIG. 6.—SUGGESTED ARRANGEMENT OF BULL PEN FOR HOUSING BULL WITHOUT THE NECESSITY OF HANDLING HIM

beets, carrots, corn silage, bran mash, and a fine quality of hay on which salt has been sprinkled. Fresh water no colder than that coming from a deep well should be supplied. If the bowels are not moving freely, a drench prepared by dissolving in two to three pints of warm water one to one and one-half pounds of Epsom salts, depending upon the size of the animal, should be given. If necessary, the dose may be repeated after a lapse of twelve hours. In giving a drench, an attendant should hold up the animal's head by a halter or by grasping the upper jaw or nostrils. The solution can best be given by the use of a long-necked, heavy glass bottle, which makes it possible to pour the liquid well back into the mouth.

*Abortion.*—The premature birth of the calf may be caused by injury to the cow resulting from being crowded in narrow doorways or gateways, slipping on wet floors, or being kicked in the abdomen. It is also attributed to moldy or poisonous food, indigestion, drugs, and ergot, which is sometimes present on rye and other grasses. When cases of abortion occur but rarely in a herd, they are usually due to injury or to accident. When several cases occur within a short time, they are usually due to an infectious disease.

*Infectious Abortion.*—One of the worst scourges with which the dairyman has to contend is infectious abortion. It spreads rapidly thru the herd, as the germs which cause it are transmitted from one animal to another. The disease causes the fetus to be expelled before fully developed, most frequently during the fifth to seventh months of pregnancy. The calf is not only lost, but the milk production and usefulness of the cow is lessened since abortion is often followed by failure of the animal to breed.

In some cases the symptoms of the approaching delivery of the fetus may be almost entirely absent; in other cases the usual signs of approaching parturition may be present, depending somewhat upon the size of the fetus and whether or not the cow is giving milk. Sometimes the only indication that a cow has aborted is a discharge from the vagina which may not appear for several days after the abortion has occurred.

The treatment of the disease consists largely of the use of measures to prevent its spread. Since information as to the ways in which the disease is carried and spread is conflicting, no treatment is known which has proved successful in all cases, but the following precautionary measures are recommended:

In purchasing animals secure them if possible from herds in which infectious abortion has not appeared. This is especially important in the case of a bull which has been in service.

Whenever an abortion occurs, isolate the cow from the herd and watch the remainder of the herd carefully for signs of an impending abortion. Cows exhibiting symptoms of premature calving should also be isolated.

Immediately after a cow aborts burn or bury the fetus, membranes, and soiled bedding. Disinfect the stall where the cow stood by wetting it thoroly with a 5-percent solution of carbolic acid or a solution of corrosive sublimate made by dissolving in a non-metallic container 1 part of corrosive sublimate (bichlorid of mercury) in 500 parts of water.

It is sometimes advisable to wash out the uterus of a cow that has aborted with an antiseptic solution made up in one of the following ways:

No. 1

Potassium permanganate . . . . . 1 teaspoonful  
Water . . . . . 3 gallons

No. 2

Lugol's solution<sup>1</sup> . . . . . 2 parts  
Boiled water . . . . . 100 parts

No. 3

Lysol . . . . . 1 part  
Water . . . . . 100 parts

Inject the solution at about body temperature into the uterus by means of a hose and funnel or apparatus designed for that purpose. Use at least one gallon of the solution for each washing. It is well to wash the adjoining external parts with the antiseptic solution.

A cow which has aborted should not be bred until all uterine discharges have ceased. The germs causing abortion are probably most frequently carried from one cow to another by the herd bull. In large herds where some of the cows have aborted, it is best to keep two bulls, reserving one for use with the heifers that are being bred for the first time and the cows that do not abort. As a measure of precaution, the sheath and belly of the bull should be washed before and after each service with one of the two latter disinfectant solutions mentioned above.

*Tuberculosis.*—It is impossible in most cases to determine from the external appearance of an animal the presence of tuberculosis in its early stages; indeed, it is seldom suspected until some members of the herd show a general unthrifty condition. Such a condition results in a decreased milk flow and may be accompanied, in advanced cases, by a short cough. Tuberculosis is caused by a specific organism or germ and is transmitted from one animal to another.

The method of procedure in the case of a herd in which the disease is suspected consists first in the identification of the diseased animals, if there be any. The most reliable means for identifying tubercular cattle is the tuberculin test.

It is better to conduct the test during the season when the herd is regularly stabled, since it is necessary, in making the test, to confine

<sup>1</sup>Lugol's solution consists of the following: Iodine, 5 parts; potassium iodide, 10 parts; and boiled water to make 100 parts

the animals in order to take their temperatures. Any unusual treatment, such as stabling in hot weather, may in itself cause variations from the normal temperature.

*Milk Fever.*—Milk fever occurs usually shortly after calving. High-producing cows, especially those in good flesh, are most frequently affected. The symptoms are an uneasiness and restlessness which may develop into excitement. The cow may move wildly about; her limbs become weak, resulting in a staggering gait. She soon falls down with her head turned toward the flank, and becomes unconscious.

The method of treatment is very simple, and if employed in time is usually successful. Air is pumped thru the milk ducts of the teats until the udder is distended. A tape is then tied about the teat to prevent the escape of air. A single inflation is often sufficient, but if

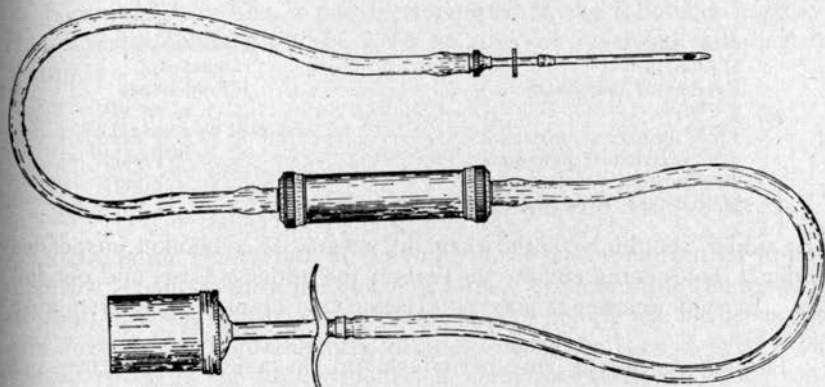


FIG. 7.—APPARATUS FOR USE IN TREATING MILK FEVER

the air escapes before the animal recovers, the udder should be reinflated. Recovery usually takes place within a few hours after the treatment is applied.

Inflation can best be accomplished by using a milk-fever outfit, which can be purchased from any dealer in veterinary supplies. It consists of a metal milk tube which is connected to an air pump by means of rubber tubing. Between the air pump and the milk tube is a chamber containing absorbent cotton for filtering the air before it enters the udder. Before using the apparatus, the milk tube and rubber tubing should be disinfected by being boiled or by being dipped into a strong solution of carbolic acid or coal-tar disinfectant, and the udder washed with soap and water. A towel may be laid below the udder to aid in preventing infection during the process of inflation.

As a precaution against the occurrence of the disease, part of the milk may be allowed to remain in the udder during the first two or three days after freshening. The cow may be milked as often as usual, but only enough of the milk should be removed to prevent congestion.

*Caked Udder.*—At the time of calving there is usually some inflammation in the udder. When this is severe, the udder becomes hard or “caked.” Other causes of inflammation are: injury to the teats, chilling of the cow by exposure to cold or storms, and the entrance of germs into the udder. In the latter case the trouble may be what is known as “garget.”

In ordinary cases of caked udder, milking several times a day, followed by thoro rubbing and massaging of the udder with the hands, proves effective. In severe cases, where the milk is thick or stringy and very small in amount, more vigorous measures are necessary. The udder should be bathed with hot water for twenty to thirty minutes three or more times a day, and thoroly dried. Then some ointment, such as one of the following mixtures, should be applied:

## No. 1

Gum camphor . . . . .	2 tablespoonfuls
Melted lard . . . . .	1 teacupful
Extract of belladonna . . . . .	1 fluid ounce

## No. 2

Fluid extract of poke root . . . . .	1 part
Fluid extract of belladonna . . . . .	1 part
Turpentine . . . . .	1 part
Melted lard, sweet oil, or cottonseed oil . . . . .	5 parts

The udder should be kept warm by means of a blanket suspended under it, holes being cut for the teats if the udder is large and pendulous. In cold weather it may be necessary to blanket the cow to keep her warm.

The ration during this period should be laxative in nature and small in amount. If the bowels are not moving freely, a drench of Epsom salts should be given. In addition one ounce of saltpeter administered twice daily for two or three days in the drinking water or as a drench is also beneficial. A physic which will act sooner than Epsom salts alone may be compounded as follows:

Epsom salts . . . . .	1 pound
Common salt . . . . .	$\frac{1}{2}$ pound
Powdered ginger . . . . .	1 tablespoonful
or blackstrap molasses . . . . .	1 cupful

*Garget.*—When certain bacteria gain entrance to the udder inflammation sets in, with the result that the tissues swell and become hard. The milk flow from the quarters affected is reduced and may be a thick, bloody or a watery fluid. In mild cases the presence of the disease is not readily detected. When udder infection is suspected, the first two streams of milk which are drawn from each teat should be milked thru a fine wire gauze strainer. Thick milk indicating the presence of infection can thus be readily seen. Such milk should not be allowed to fall on the floor of the stalls, as it may be a means of conveying the disease to other cows, since garget is regarded as infectious.



To aid in preventing the spread of the disease it is well to milk the infected cows last, after which the hands of the milker should be thoroly washed; and if a milking machine is used, the teat cups should be thoroly disinfected. The cows' teats may also be treated after each milking with a disinfectant solution<sup>1</sup> applied by holding a panful of the solution under the udder so that the teats are immersed for a few minutes.

The general treatment recommended for caked udder should also be applied, except that no camphor should be used in the salve.

*Sore Teats.*—The causes of sore teats are numerous, one of the most frequent being chapping in cold weather. Vaseline, oxide of zinc, or other good salve should be applied after each milking until the soreness disappears.

When teats are torn a powder composed of the following ingredients may be dusted into the sores to prevent infection and hasten healing.

Calomel . . . . .	1 part
Subnitrate of bismuth . . . . .	1 part
Boric acid . . . . .	6 parts

### HERD RECORDS

A maximum production of the dairy herd cannot be secured unless each cow is contributing her share of milk. To determine the amount of profit and loss caused by each cow and to enable the herdsman to care for the herd intelligently it is necessary to keep a system of records covering the milk production, breeding dates, and feed consumption of each cow. With a grade herd the record system need not be elaborate, but a few accurately-kept items are essential.

*Identification of Each Animal.*—It is a good practice to assign a name or number to every animal in the herd for purposes of identification. A diagram or photograph of the animal may be placed upon a card which bears also its name or number, the date of birth, name of sire and dam, breeding record, record of offspring, and summary of milk production. Instead of a card for each animal, the information may be kept in loose-leaf books containing a sheet for each animal. Convenient blank forms for this purpose may be purchased from the various breed associations.

*Breeding Records.*—Records of the dates of breeding and calving should always be carefully kept by the herdsman. It is important that the date of the next freshening of each cow be known in order that she may be given the proper care before freshening. The date of last freshening should also be recorded so that she can be bred again at

<sup>1</sup>Suitable solutions for this purpose may be prepared by adding a teaspoonful of one of the following preparations to a quart of water: Pyxol Barrett Mfg. Co., New York City; Wescol, West Disinfecting Co., New York City; Hycol, Merck & Co., New York City.





## BREEDING RECORD—DAIRY HERD NO. 3

January 11, 1917

<i>No. of cow</i>	<i>Date freshened</i>	<i>Date to breed</i>	<i>Date bred</i>	<i>Sire used</i>
1034	Oct. 25, 1916	at once		
1042	Nov. 9, 1916	at once		
1037	Nov. 15, 1916	Jan. 15, 1917		
1040	Nov. 29, 1916	Jan. 29, 1917		
1038	Dec. 25, 1916	Feb. 25, 1917		
1036	Jan. 2, 1917	Mar. 2, 1917		

<i>No. of cow</i>	<i>Date bred</i>	<i>Sire used</i>	<i>Due to freshen</i>	<i>Freshened</i>
1041	Apr. 20, '16	Homestead	Jan. 27, '17	
1039	May 3, '16	Homestead	Feb. 9, '17	
1032	Oct. 4, '16	Homestead	July 13, '17	
1033	Dec. 7, '16	Homestead	Sept. 15, '17	

*Production Records.*—The greatest advantage in keeping records of the milk and butter-fat production of each cow is that the unprofitable producers may thus be ascertained and gradually eliminated from the herd. Another advantage is that the cows may be fed in proportion to their milk production. This usually results in more economical feeding and oftentimes in increased production where cows have previously been fed less than they could utilize to advantage. Production records may be kept by the herdsman, or under the supervision of a cow testing or breed association.

*Private Records*

There are several methods of keeping milk records. The most accurate is to weigh and record the milk produced at each milking of each cow; another method which may be used with approximate accuracy is to weigh the milk one day each week or for three consecutive days in the middle of each month, and with those weights as a basis compute the monthly production. Daily weighing of the milk enables the herdsman to feed each cow in proportion to her milk yield and also calls attention at once to a sudden fluctuation in the milk yield. A sudden drop may indicate some abnormal condition such as illness.

At least once each month a composite sample of each cow's milk should be tested for butter fat by the Babcock test. Directions for conducting this test are contained in Circular 174 of this station.

*Cow-Testing Associations*

In several sections of Illinois, cow-testing associations are in operation. Such associations provide an inexpensive method for securing production records of the herds of a number of dairymen of a community. Under this system it is not necessary for the herdsman to keep production records of the herd; the work is performed at a moderate cost by a tester hired by the association. For further infor-

MONTH \_\_\_\_\_ MILK RECORD 19\_\_

DATE		NAME OR NUMBER OF COW											
1	AM												
2	AM												
3	AM												
4	AM												
5	AM												
6	AM												
7	AM												
8	AM												
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25	AM												
26	AM												
27	AM												
28	AM												
29	AM												
30	AM												
31	AM												
TOTAL													
AV. TEST													
LBS. FAT													

FIG. 10.—SUGGESTED FORM OF MILK RECORD SHEET FOR RECORDING WEIGHTS OF MILK FROM INDIVIDUAL COWS



mation concerning cow-testing associations, see Circular 196 of this station.

### *Official Records*

Under the supervision of the various breed associations, official tests are conducted on pure-bred dairy cows. For several years past the Department of Dairy Husbandry has supervised for the breed associations the making of official records within the state. Further information may be secured from the breed associations or from the above department.

### *Necessary Equipment*

A spring balance for weighing the milk of each cow is essential. In the one shown in Fig. 10 one hand may be set at zero when the empty milk pail is hung on the balance. The amount of milk may then be read directly without subtracting the weight of the pail each time. In case pails of different weights are used by the milkers, a pail particularly for weighing may be kept beside the scales. It is advisable to have the weigh-pail constructed with vertical sides so that in sampling the milk by means of a sampling tube an accurate sample may be obtained.

Where samples are taken infrequently and from pails with sloping sides, they may be taken by a small dipper after the milk has been thoroly mixed by being poured from one pail to another. Equipment, as well as milk-record forms, may be purchased from dairy supply houses.

### FREQUENCY OF MILKING

Most cows give more milk if milked three or four times per day than if milked but twice. Under ordinary conditions the increased amount of milk does not compensate for the extra labor, unless the cows are giving an unusually large flow. It is usually considered profitable to milk more than twice a day those cows giving more than 60 pounds daily, since the retention of a large quantity of milk for a period of several hours tends to cause congestion. When cows are being milked in official tests, it is customary to milk three or four times per day at equal intervals.



Fig. 11.—Milk Scale Having Capacity of Thirty Pounds. Dial is Graduated to .05 Pound

## SALT

One of the best methods for supplying salt to dairy cattle is to keep a supply of the ordinary crystal salt in a box in the yard so that the cattle have access to it daily. In this way they get a sufficient amount and do not overeat. To prevent waste of salt during rain, a cover or roof may be placed two or three feet above the box, or the box may be constructed of concrete. In the latter case, after a rain the cows readily drink the salty water.

If a certain amount of salt is placed in the grain mixture, which is fed in proportion to the milk production, the cows may receive

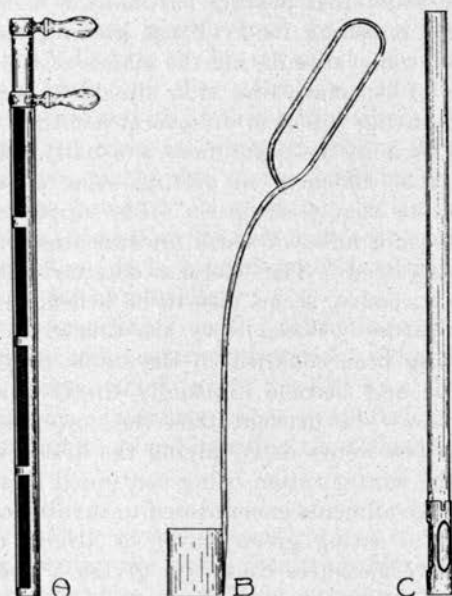


FIG. 12.—MILK SAMPLERS OF VARIOUS FORMS  
A—MCKAY OR C. P. B—DIPPER. C—SCOVILLE

an excess during the first part of the lactation period and a deficiency during the latter part. A large amount of salt is required by dairy cows and harmful effects result if salt is withheld.

## SPOILED FEEDS

A frequent cause of indigestion of farm animals is the feeding of moldy or decayed feeds. Such feeds have but limited use in the rations of dairy cows. If a high production of milk is to be maintained, it is important that the feeds be in good condition. Grain which has fermented, or "heated," and hay or silage which has become moldy must be fed with caution, if at all.

## PROBLEMS OF SUMMER CARE

### PROTECTION FROM SUN

During the hot summer months it is desirable to provide shade, such as trees, or a shed open on all sides, to protect the cattle from the sun. Cows suffer from extreme heat as well as from extreme cold. Loss of appetite and disturbance of the body functions are not uncommonly caused by heat.

### VALUE OF PASTURE

There is little doubt that pasture has many beneficial effects aside from its value in furnishing food. Fresh green grass has a laxative effect and acts as a tonic, stimulating the glands of the body to greater activity, which is of especial value after the dairy herd has been consuming dry feed during a period of several months. When cows are kept on dry feed thruout the year, there is usually, after several such seasons, considerable difficulty in getting some of them with calf. There is a possibility that fresh green feeds supply certain minerals and other valuable substances of a still undetermined nature which are lacking in the dry feed. The exercise obtained while at pasture, when this is not excessive, seems also to be beneficial.

*Turning to Pasture.*—When cows are turned to pasture in the spring after having been confined in the stable or yard, they roam about eating little and become unusually tired, which results in a decreased milk flow. To prevent this, the cows should be left on pasture for but a few hours daily during the first few days, some of the dry feed of the winter ration being continued in small quantities.

Bloat is one of the ailments encountered in turning cattle to pasture. It is usually due to eating green clover or alfalfa damp with dew or rain. Preventive measures consist in giving a liberal feed of dry roughage and in keeping the cattle from the pasture until the grass is dry.

*Pasture Alone Not Sufficient.*—The feed secured from a scant, dry pasture is often not more than enough to furnish a maintenance ration for cows. When this is true, the feeding of some green crops or corn silage is to be recommended, since, except under very adverse conditions, if sufficient feed is supplied a good milk flow can be maintained. In most sections of Illinois corn silage may be used more advantageously than soiling crops as a supplement to pasture.

### SOILING

The feeding of green crops, instead of pasturing or as a supplement to pasture, has several advantages from the standpoint of intensive farming, the principal one being that more feed can be produced by

means of green crops than upon an equal area devoted to pasture. More labor, however, is required than if the cows are pastured, and this occurs during the season when labor can be used most profitably in other farm work.

In hot weather green crops mature rapidly, so that the time during which any one crop remains in a uniform condition for feeding is of short duration. It is impracticable to harvest several days' supply of green feed at one time since green feeds heat readily when stored.

### FLIES

It is difficult to maintain a good milk flow during the summer months when flies are most troublesome. In many cases, however, the decrease in milk production is due as much to a lack of sufficient feed as to the annoyance by flies. Studies made at various experiment stations have seemed to indicate that there is no increase in milk production when cows are sprayed with a fly repellant. This result may have been partly due to the inefficiency of the spraying materials. There is, however, an advantage in using a fly repellant shortly before the milking hour, as this makes it possible for the cows to stand more quietly. It is a good practice also to protect young calves from flies so far as possible.

Many of the fly repellants on the market are effective for a few hours only, owing to their rapid evaporation. The use of a repellant in the form of a grease, which can be applied by a cloth or brush, has been of value in some instances, since evaporation is not so rapid. Such a repellant may be mixed by using the following formula:

Lard .....	1 gallon
Sulfur .....	2 pounds
Kerosene .....	1 pint

Some aids in keeping the stable free from flies are cleanliness and darkness. Flies reproduce rapidly in manure and other decaying organic matter, so that the removal of manure to the fields or to a considerable distance from the stable is desirable. The windows may be darkened by nailing over them, on the inside, tar or building paper. Gunny sacks may be hung in the doorway, or a few feet outside the doorway, in such a manner that some of the flies will be brushed from the cows' backs as they enter the stable.

## PROBLEMS OF WINTER CARE

### HOUSING

In most sections of Illinois it is necessary to provide shelter for the dairy herd during a considerable portion of the year. Dairy cows are sensitive to the conditions which surround them, and confinement in a dark, poorly ventilated stable tends to retard production. In housing the dairy herd it is economy to provide quarters containing

comfortable stalls and an abundance of light and fresh air. Especial care should be exercised in giving protection from storms, as exposure to storms in cold weather may lead to some ailment or impairment of health.

Comfort in the stable is not necessarily secured by a high temperature; a temperature of 40° to 50° F. is considered desirable. One of the essentials in securing comfort is to provide well-bedded stalls of proper size, constructed of material that does not readily conduct heat and cold. A good system of ventilation supplying fresh air without drafts is a necessity in the dairy barn. For information on the arrangement of rectangular dairy barns see Circular 199 of this station.

Altho it is essential that cows be provided with comfortable quarters during cold weather, a moderate amount of outdoor exercise is beneficial. The practice of turning the herd into a sheltered yard for exercise for a short period each day, except in very cold or stormy weather, is practiced on many farms. Many dairymen desire to utilize the feed in stalk fields in which the corn has been harvested. This may often be done to advantage by turning heifers and dry cows into the fields during the day in mild weather. When milch cows must obtain a large part of their ration from stalk fields in cold weather, there is often a very small milk production, since the feed eaten supplies little more than maintenance.

### WARMING WATER

Dairy cows in milk require a large amount of water, 70 to 100 pounds being consumed daily under ordinary conditions. In winter there will be an increased consumption of water if it is warmed so that it is not colder than that coming from a deep well. Drinking troughs and tanks should be cleaned frequently to avoid, so far as possible, the growth and spread of diseases.

### GROOMING

The daily grooming of cows, especially in winter, helps keep the hair and skin soft and in good condition. The handling occasioned by grooming often proves beneficial in making those cows which are very nervous and excitable more gentle. When properly done it is also an aid in the production of clean milk.

### DEHORNING

The practice of dehorning dairy cows is to be commended under most conditions. The advantages gained more than offset the losses occasioned by the fighting of the animals or by the temporary decrease



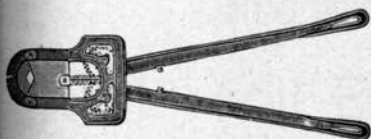


FIG. 13.—DEHORNING SHEARS  
(Courtesy Leavitt Mfg. Co.)

in milk yield caused by dehorning. It is generally considered that well-shaped and polished horns add to the appearance of an animal in the show ring, so that in case of show herds dehorning is not practiced.

Dehorning should be done at a season when there are no flies to infect the wounds. If the growth of horns was not prevented when the animals were young calves, the horns are best removed after the animals have reached the age of two years, as otherwise there is a tendency for the stubs to grow. In removing the horns, they should be cut at a point  $\frac{1}{4}$  to  $\frac{1}{2}$  inch below the junction of the skin with the base of the horn; if cut higher, they may continue to grow. Dehorning shears or saw are instruments designed especially for removing horns easily and quickly.

*Preventing Growth of Horns.*—It is possible, by a simple treatment, to prevent the growth of horns on young calves. When the animal is three to five days of age, the hair around the horn buttons, or developing horns is cut away so that the horns can be seen or felt. To perform the operation, a stick of caustic potash or caustic soda is moistened slightly and rubbed on the horn button, care being taken that none of the caustic gets on other parts of the skin or on the hands of the operator. The caustic destroys the horn, leaving but a slight depression. If the first application does not prove effective in cauterizing the horn, another application may be made in three or four days. This treatment is much more convenient to apply and causes less of a shock to the animal than dehorning after the animal is grown.